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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2017-18 11.01.2018

TEST REPORT ON BITUMEN CONTENT OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
* Sample ID	:	For UGD trenches in Ward No.13.
Technical Reference	:	IRC:SP:11-1984
Date of Testing	:	11.01.2018

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473	472
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	27	28.00
7. Bitumen content in %	5.40	5.60
8. Average	**5.50**	

*Information is furnished by the Customer/Representative.

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ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ
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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2017-18 11.01.2018

TEST REPORT ON BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
* Sample ID	:	For UGD trenches in Ward No.13.
Technical Reference	:	IS 2386 and IRC:SP:11-1984
Date of Testing	:	11.01.2018

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	33.21	7.02	7.02	92.98	79-100
9.5	35.21	7.44	14.47	85.53	70-88
4.75	73.25	15.49	29.95	70.05	53-71
2.36	65.25	13.79	43.75	56.25	42-58
1.18	52.25	11.05	54.79	45.21	34-48
0.6	54.23	11.47	66.26	33.74	26-38
0.3	46.63	9.86	76.12	23.88	18-28
0.15	34.26	7.24	83.36	16.64	12-20
0.075	44.26	9.36	92.72	7.28	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	34.26	7.26	7.26	92.74	79-100
9.5	45.56	9.65	16.91	83.09	70-88
4.75	65.26	13.83	30.74	69.26	53-71
2.36	76.26	16.16	46.89	53.11	42-58
1.18	66.32	14.05	60.94	39.06	34-48
0.6	52.32	11.08	72.03	27.97	26-38
0.3	30.25	6.41	78.44	21.56	18-28
0.15	26.62	5.64	84.08	15.92	12-20
0.075	37.25	7.89	91.97	8.03	4-10

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Agg/2017-18 11.01.2018

TEST REPORT ON GRADATION OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
* Sample ID	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Hot mix plant, Bangalore
Date of Testing	:	11.01.2018

Total Weight of Sample: **5200** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	730	14.04	14.04	85.96	79 - 100	
9.5	575	11.06	25.10	74.90	70 - 88	
4.75	640	12.31	37.40	62.60	53 - 71	
2.36	585	11.25	48.65	51.35	42 - 58	
1.18	525	10.10	58.75	41.25	34 - 48	
0.600	535	10.29	69.04	30.96	26 - 38	
0.300	590	11.35	80.38	19.62	18 - 28	
0.150	305	5.87	86.25	13.75	12 - 20	
0.075	330	6.35	92.60	7.40	4 - 10	

Total Weight of Sample: **5250** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	610	11.62	11.62	88.38	79 - 100	
9.5	630	12.00	23.62	76.38	70 - 88	
4.75	640	12.19	35.81	64.19	53 - 71	
2.36	580	11.05	46.86	53.14	42 - 58	
1.18	610	11.62	58.48	41.52	34 - 48	
0.600	540	10.29	68.76	31.24	26 - 38	
0.300	520	9.90	78.67	21.33	18 - 28	
0.150	350	6.67	85.33	14.67	12 - 20	
0.075	455	8.67	94.00	6.00	4 - 10	

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Stability/2017-18 11.01.2018

TEST REPORT ON MARSHALL STABILITY OF MIX

*** Customer**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Technical Manager (West),** KRIDL, Bangalore.
***Name of the Work**	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
***Reference**	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
*** Source**	:	Hot mix Plant, Bangalore
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	11.01.2018

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability (Kn at 60°C)	9.35	9.60	9 Kn (min)
2	Marshall flow (mm)	3.05	3.85	2 – 4
3	Voids in Compacted Mix %	3.15	3.80	3 – 6
4	Percent voids in Mineral Aggregate (VMA)	13.05	13.60	13 - 15
5	Percent Voids filled with Bitumen (VFB)	67.25	68.35	65 - 75
6	Density, g/cc	2.27	2.28	--

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T-2377

Job No.: CTCE/BBMP/KRIDL/W.No.13/CSR-12/523/QB(BM)/2017-18 09.01.2018

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of work	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
* Sample ID	:	Bitumen
Source/ Location	:	Hot Mix Plant, Bangalore.
Sample Received on	:	07.01.2018
Period of Testing	:	07.01.2018 to 09.01.2018

The results of the tests conducted on the bitumen sample are as follows:

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2014)	68	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2014)	46	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2014)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2014)	308	Min. 220

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VIDYARANI P.K.
Technical Manager

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Job No: CTCE/BBMP/KRIDL/W.No.13/BM/AIV/2017-18 09.01.2018

TEST REPORT ON IMPACT VALUE OF AGGREGATES

*** Customer**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
*** Agency**	:	**Technical Manager (West),** KRIDL, Bangalore.
*** Name of Work**	:	Improvements UGD line in Ward No.13, Mallasandra, BBMP, Bangalore.
*** Reference**	:	BBMP/EE/DD/WO/141/2017-18 Dated: 21.12.2017
*** Sample ID**	:	Hot Mix Plant, Bangalore
Technical Reference	:	IS : 2386(Part -4)-1963 (RA-2011)
*** Type of Mix**	:	Bituminous Macadam
Date of Testing	:	09.01.2018

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	304	
4	Aggregate Impact value = percent fines 100* (W2/W1)%	21.76	21.85	**21.81**

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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